

RESEARCH DEPARTMENT

A RE-SURVEY OF THE SERVICE AREA OF THE WROTHAM
V.H.F. SOUND TRANSMITTERS

Report No. K-151

(1961/14)

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August 1961

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SUMMARY

This report gives the results of a more detailed field strength survey of the Wrotham v.h.f. sound transmitters than that undertaken when the original survey was made.

1. INTRODUCTION

Experimental v.h.f. sound transmissions started at Wrotham on 17th July 1950. Two transmissions were radiated, one frequency modulated and one amplitude modulated. A field strength survey was made in 1952 and a report issued.¹ The map for this report was based on eleven radial cruises from the transmitter and, while this method provides a fairly accurate map, it gives no information on the field strength in towns.

The first public v.h.f. f.m. sound transmission in the United Kingdom started at Wrotham on 2nd May 1955, the Light, Third and Home programmes being radiated from a common aerial. Recently a re-survey of the service area was made and the results are presented in this report.

2. GENERAL

The Wrotham v.h.f. sound transmitters are situated 11 miles (18 km) west-north-west of Maidstone. The site height is 720 ft (219 m) above mean sea level. The Light, Third and Home programmes are radiated on frequencies of 89.1 Mc/s, 91.3 Mc/s and 93.5 Mc/s respectively by a common aerial, consisting of eight tiers each of four slots, mounted 406 ft (124 m) above ground level. The horizontal radiation pattern (h.r.p.) is within ± 0.5 dB of being omnidirectional. The mean effective radiated power (e.r.p.) of each transmission is 121 kW.

3. RESULTS

The results of the survey are presented in a field strength contour map, Fig. 1, while details of the field strength in towns which have a population of 5000 or more are given in the Appendix. The map shows the 2.0 mV/m, 1.0 mV/m, 0.5 mV/m and 0.25 mV/m field strength contours and, when compared with the map in the original survey,¹ differs in two respects. The first is that the positions of



Note:
The contours represent field strength in mV/m at 30 ft (9.1m) above ground exceeded at 50% of receiving sites in a given locality. The value exceeded at 90% of receiving sites may be as much as 10dB below the value indicated by the contours particularly in hilly and built-up areas.

— Approximate contours for Rowridge.

Population within:-

2.0 mV/m	10,967,400
1.0 mV/m	11,990,500
0.5 mV/m	12,936,300
0.25 mV/m	13,533,330

WROTHAM BAND II (MEASURED)

SITE HEIGHT: 720 ft (219 m) AMSL
AERIAL HEIGHT: 406 ft (124 m) AGL
E.R.P.: 121 kW
POLARIZATION: HORIZONTAL
AERIAL: EIGHT TIERS EACH OF FOUR SLOTS.
H.R.P. OMNIDIRECTIONAL

Fig. 1

10 0 10 20 Miles
10 0 10 20 30 Kilometres

Topographical information based upon the Ordnance Survey map with the sanction of the Controller of H.M. Stationery Office.
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the contours on the new map fluctuate much more about a mean radius from Wrotham. The second is that in the sector south to west the service is rather poorer than indicated on the original map while in all other directions the service is, in general, rather better. These differences are attributed to the fact that eleven radials do not provide sufficient information for the production of an accurate service map in terrain of the type encountered in south-east England. Many more measurements taken on the new survey permit a much more detailed map to be drawn.

The population within the various contours has been estimated by Engineering Information Department and the results are tabulated below.

Field Strength in mV/m at 30 ft (9.1 m) a.g.l.	Population
2.0	10,967,400
1.0	11,990,500
0.5	12,936,300
0.25	13,533,330

4. CONCLUSIONS

The service in all sectors except south/west is, in general, slightly better than that indicated by the previous survey.¹ In the south-west sector the service is definitely inferior to that indicated in the earlier report. Nevertheless, the overlap with the Rowridge v.h.f. service is such that the service in the area concerned is adequate.

5. REFERENCE

1. "Wrotham Transmitter Field Strength Survey", Research Department Report No. 082, Serial No. 1952/21.

APPENDIX

Field strength in mV/m at 30 ft (9.1 m) a.g.l.

Town	Field strength exceeded at stated percentage locations			Town	Field strength exceeded at stated percentage locations		
	10%	50%	90%		10%	50%	90%
Abbots Langley	12	4.5	1.4	Eastbourne	4.2	1.3	0.56
Abingdon (Berks)	0.42	0.27	0.13	Egham	6.0	4.0	2.0
Aldershot	1.8	1.0	0.47	Elstree	12	7.1	3.5
Alton (Hants)	0.42	0.18	0.06	Epsom	3.7	1.8	0.94
Amersham	7.9	4.0	1.0				
Ashford (Kent)	3.7	1.9	0.97	Farnborough (Hants)	2.2	1.3	0.75
Ashstead	2.5	1.5	0.84	Farnham (Surrey)	0.67	0.3	0.11
Aylesbury	1.6	0.89	0.35	Felixstowe	0.84	0.6	0.28
				Fleet	1.7	1.1	0.53
Baldock	0.56	0.28	0.17	Folkestone	2.0	0.32	0.06
Basingstoke	0.6	0.25	0.14	Frimley	1.9	1.3	0.53
Beaconsfield	6.7	3.7	1.7	Frinton	2.4	1.5	0.89
Bedford	0.37	0.18	0.08				
Berkhamsted	1.2	0.63	0.28	Godalming	1.1	0.42	0.12
Bexhill	2.7	1.3	0.63	Guildford	2.0	0.53	0.08
Biggleswade	0.56	0.35	0.15				
Bishop's Stortford	4.5	2.4	0.79	Halstead (Essex)	1.8	0.47	0.17
Braintree	3.3	2.0	0.75	Harlow New Town	5.6	3.2	1.5
Broadstairs	1.8	0.79	0.24	Harpenden	4.5	2.2	1.0
Bury St. Edmunds	0.22	0.08	0.03	Harwich	1.0	0.56	0.2
Bushey	3.2	2.5	1.0	Haslemere	9.4	3.5	1.8
Byfleet	2.7	1.3	0.75	Hastings	4.2	1.0	0.13
Cambridge	0.3	0.18	0.07	Hatfield (Herts)	6.7	3.2	1.4
Camberley	4.7	1.6	0.6	Hayes (Middlesex)	8.4	6.0	2.4
Canterbury	2.4	0.89	0.33	Hemel Hempstead	4.5	1.5	0.32
Caversham	1.9	1.3	0.53	Henley on Thames	3.5	1.3	0.33
Chalfont St. Peter	9.4	5.6	1.0	Herne Bay	6.3	2.4	1.5
Chelmsford	8.4	4.0	1.3	Hertford	5.6	2.4	0.71
Chertsey	5.3	3.0	1.5	High Wycombe	7.5	2.0	0.42
Chesham	1.6	0.56	0.2	Hitchin	1.3	0.6	0.21
Cheshunt	11	7.1	3.7	Hoddesdon	8.9	5.0	2.7
Clacton-on-Sea	2.5	1.6	0.84	Horley (Surrey)	7.9	5.6	3.0
Cobham (Surrey)	3.3	1.9	0.75	Horsham (Sussex)	2.5	1.1	0.42
Colchester	3.2	1.3	0.37	Hythe	2.0	0.7	0.12
Cranleigh	2.4	1.8	1.0				
Crawley (Sussex)	10	6.3	3.7	Ipswich	0.71	0.35	0.12
Croxleygreen	2.7	1.8	0.94				
Cuckfield	6.7	2.8	0.97	King's Langley	2.5	1.8	0.94
Deal	1.5	0.3	0.06	Leatherhead	1.9	0.84	0.35
Didcot	0.71	0.45	0.28	Letchworth	1.0	0.53	0.25
Dorking	8.9	2.0	0.5	Lewes	10	2.1	0.33
Dover	0.9	0.15	0.06	Luton	2.4	0.84	0.33
Dunstable	2.5	1.6	0.89				

Town	Field strength exceeded at stated percentage locations			Town	Field strength exceeded at stated percentage locations		
	10%	50%	90%		10%	50%	90%
Maidenhead	4.7	2.5	1.2	South Mimms	7.1	3.3	1.7
Maldon	8.4	3.7	1.7	Sunninghill	10	5.3	2.7
Margate	2.7	1.0	0.42				
Marlow	3.5	1.6	0.84	Tring	1.9	0.75	0.17
Newbury	0.33	0.19	0.08	Uxbridge	5.3	3.0	1.2
Newmarket	0.2	0.13	0.05				
				Walton-on-the-Naze	2.4	0.6	0.4
Oxford	0.37	0.17	0.08	Walton-upon-Thames	6.7	4.7	2.1
				Wantage	0.13	0.05	0.03
Petersfield	1.7	0.45	0.13	Ware	8.9	4.2	1.8
Potters Bar	37	17	8.4	Watford	7.1	3.5	1.7
				Welwyn	3.3	1.8	0.75
Ramsgate	2.7	0.67	0.21	Welwyn Garden City	7.1	4.5	2.2
Rayleigh	27	10	3.3	Weybridge	6.0	2.8	1.0
Reading	1.6	0.75	0.37	Whitehill (Hants)	0.67	0.33	0.12
Redhill	13	5.3	1.6	Windsor	5.3	3.5	1.1
Reigate	12	4.0	1.8	Witham	4.0	2.4	1.2
Rickmansworth	4.2	1.1	0.35	Witley	1.6	0.89	0.25
Ripley	2.4	1.5	0.75	Woking	3.5	1.7	0.67
Ruislip	7.1	4.5	1.9	Wokingham	2.7	1.6	0.79
				Wolverton	0.53	0.19	0.08
St. Albans	11	4.5	1.3	Wooburn	2.0	0.63	0.19
Sandhurst	3.3	1.3	0.53	Woodbridge	0.67	0.27	0.07
Seaford	1.1	0.63	0.37				
Slough	3.7	2.5	1.8				